

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application.

Listing of Claims

1. (Withdrawn) A reflector comprising:

an embossed layer having a reflective surface having a plurality of recesses; and

an embossed base disposed on a surface of the embossed layer opposing the reflective surface,

wherein the embossed layer comprises a heat-embossed layer and a highly reflective film laminated thereon, the highly reflective film having the reflective surface, and the embossed base comprises a moisture-proof base material, which comprises polyphenylene sulfide or polyvinylidene fluoride, and

wherein the embossed base is separable from the embossed layer.

2 - 3. (Canceled)

4. (Withdrawn) The reflector according to claim 1, wherein the heat-embossed layer comprises a lamination of a processed resin layer disposed on a reflective surface side having the recesses, and a support resin layer disposed on a moisture-proof base material side and exhibiting a higher glass transition temperature than that of the processed resin layer.

5. (Withdrawn) The reflector according to claim 1, further comprising an adhesive layer laminated on the highly reflective film, and a protecting material provided on the adhesive layer.

6. (Withdrawn) A liquid crystal display panel comprising:
a first substrate having a display surface;
a second substrate disposed opposite to the first substrate;
a liquid crystal layer disposed between the first and second substrates; and
a reflector disposed on the second substrate opposite to the liquid crystal layer;
wherein the reflector comprises a heat-embossed layer having a reflective surface having a plurality of recesses, a highly reflective film laminated on the heat-embossed layer and having the reflective surface, and a moisture-proof base material laminated on an opposite side of the heat-embossed layer to the reflective surface.

7 - 8. (Cancelled)

9. (Withdrawn) The reflector according to claim1, further comprising an adhesive layer laminated on the reflective surface, and a protecting layer disposed on the adhesive layer.

10. (Withdrawn) The reflector according to claim1, wherein the embossed layer includes a thermoplastic resin.

11. (Withdrawn) The reflector according to claim 1, wherein the embossed layer includes an ultraviolet curable resin.

12. (Withdrawn) A liquid crystal display panel comprising:
a first substrate having a display surface;
a second substrate disposed opposite to the first substrate;
a liquid crystal layer disposed between the first and second substrates; and
a reflector disposed on the opposite side of the second substrate to a liquid crystal layer-facing side;
wherein the reflector comprises an adhesive layer disposed in contact with the second substrate, an embossed layer laminated on the adhesive layer with a reflective surface facing the liquid crystal layer side and having a plurality of recesses, and an embossed base separable from the embossed layer and disposed on an opposite side of the embossed layer to the reflective surface.

13. (Withdrawn) The reflector according to claim 5, wherein the protecting material is disposed between the adhesive layer and a liquid crystal layer.

14. (Withdrawn) The reflector according to claim 13, wherein the protecting material comprises a substrate of a liquid crystal display panel.

15. (Withdrawn) A reflector comprising:
an embossed layer having a reflective surface having a plurality of recesses; and

an embossed base disposed on a surface of the embossed layer opposing the reflective surface,

wherein an inner surface of each recess includes two spherical surfaces having different radii.

16. (Withdrawn) The reflector according to claim 1,

wherein the recesses are formed with random depths in a range of 0.1 μm to 3 μm , random pitches of adjacent recesses in a range of 5 μm to 100 μm , and inclination angles of inner surfaces are set in a range of -18 degrees to +18 degrees.

17. (Withdrawn) The reflector according to claim 1,

wherein the recesses have a substantially constant reflectance in an acceptance angle range of ± 10 degrees around a regular reflection direction as a center to provide a symmetrical distribution of reflection characteristics around the regular reflection direction.

18. (Withdrawn) A reflector comprising:

an embossed layer having a reflective surface having a plurality of recesses; and
an embossed base disposed on a surface of the embossed layer opposing the reflective surface,

wherein a reflectance is maximized at a reflection angle smaller than a reflection angle in a regular reflection direction.

19. (Withdrawn) A reflector comprising:

an embossed layer having a reflective surface having a plurality of recesses; and
an embossed base disposed on a surface of the embossed layer opposing the reflective surface,

wherein an inner surface shape of each recess comprises a first curve extending from a peripheral edge of the recess to a vertex of the recess and a second curve continued from the first curve and extending from the vertex of the recess to the an opposing peripheral edge, and

wherein an average absolute value of an inclination angle, which is defined as an angle of a tangent line with a horizontal surface at any position of the inner surface of the recess, of the first curve is larger than that of the second curve.

20. (Withdrawn) The reflector according to claim 1, further comprising a separating layer disposed between the embossed layer and the embossed base.

21. (Currently Amended) A reflector attached to an outer surface of a glass substrate comprising:

an adhesive layer attached to the glass substrate;
a reflective film;
a processed resin layer having a plurality of recesses, which define a reflection characteristic of the reflective film ; and
a moisture-proof film base that supports the processed resin layer,

wherein the reflective film is disposed between the adhesive film and brought into direct contact with the processed resin layer such that a shape of the plurality of recesses of the processed resin layer is reflected in the reflective film and wherein the adhesive film and the glass substrate, in that order, are laminated upon the reflective film,

wherein the recesses are formed in a spherical shape for reflection and randomly arranged, and contact portions between the recesses are formed in a peaked shape, and

wherein the moisture-proof film base includes a material with low moisture absorption and low moisture permeation and has a thickness of 0.05 to 1 mm.

22. (Currently Amended) A method of forming a reflector attached to the outer surface of a glass substrate, the reflector including an adhesive layer attached to the glass substrate, a reflective film, a processed resin layer having a plurality of recesses which define a reflection characteristic of the reflective film, and a moisture-proof film base for supporting the processed resin layer, the method comprising:

pressing a roll-shaped embossing mother die having an irregular surface onto the surface of the processed resin layer,

rotating the roll-shaped embossing mother die to transfer the irregular shape of the roll to the processed resin layer,

curing the processed resin layer,

reflecting the plurality of recesses of the process resin layer in the reflective film by bringing the reflective film into direct contact with the processed resin layer, and

laminating the adhesive film and the glass substrate, in that order, upon the reflective film,

wherein the recesses are formed in a spherical shape for reflection and are randomly arranged, and

wherein contact portions between the recesses are formed in a peaked shape.

23. (Previously Presented) The reflector according to claim 21, wherein the moisture-proof film base includes polyphenylene sulfide or polyvinylidene fluoride.

24. (Previously Presented) The method according to claim 22, wherein the roll-shaped embossing mother die includes a cylindrical embossing roll and an electroforming plate wound on the embossing roll, the surface of the electroforming plate having irregularities corresponding to the shape of the recesses.

25. (Previously Presented) The reflector according to claim 21, wherein a support resin layer having a high glass transition temperature is interposed between the processed resin layer and the moisture-proof film base.

26. (Previously Presented) The method according to claim 22, wherein the roll-shaped embossing mother die includes heating surface to heat the processed resin layer.

27 (New) The method according to Claim 21, wherein a thickness of the reflective film is between 80 nm and 200 nm.

28 (New) The method according to Claim 22, wherein a thickness of the reflective film is between 80 nm and 200 nm.